REMARKS

Claims 1, 3-6 and 10-18 are pending in the subject application. No claims have been indicated to be allowable.

The claims have been amended to recite Applicants' invention in a clear and concise manner. No new matter has been added by the herein Amendment to the claims.

35 USC 112

Claims 1, 3-6, 10-13 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. This rejection is traversed.

The Examiner has suggested the recitation of a substance "containing 50%" is missing. Claims 1, 14 and 17 have been amended to state that the acidic metal oxide support contains at least 50% alumina.

It is believed that the claims as amended are now written in a clear and definite manner. Accordingly, this rejection is moot and should now be withdrawn.

Claim Objections

Claims 14-18 stand objected to as containing certain informalities. Claims 14-18 have now been amended to recite "at least one" alkaline earth metal. Accordingly, the basis for the Examiner's objection has been overcome. Accordingly, Applicants' hereby petition for withdrawal of the objection to the claims.

35 USC 103

Claims 1, 3-6, 10-18 stand rejected under 35 USC 103(a) as being unpatentable over Vasalos et al. (USP 4,153,535). This rejection is respectfully traversed.

Applicants' invention has now been clearly defined to comprise novel NO_x removal compositions, a fluid cracking catalyst comprising said NO_x removal compositions and a method of using the NO_x removal compositions to reduce simultaneously NO_x and CO emissions during an FCC regeneration process. Generally, the composition of the invention comprises a component which contains (i) an acidic oxide support containing at least 50 weight percent alumina, (ii) about 1-10 parts by weight, measured as the metal oxide, of at least one alkaline earth metal, (iii) at least 1 part by weight of a transition metal oxide having oxygen storage capability, and (iv) at least 0.01 parts by weight of palladium, all parts by weight being per 100 parts by weight of the acidic oxide support.

As stated in Applicants' Amendment dated April 20, 2003, it is well known in the catalysis art, as noted in the Background of Applicants' specification, that the amount of NO_x emitted during the regeneration step of an FCC process is an "inverse function" of the amount of CO emitted from the FCC regenerator. That is, the amount of NO_x emitted would be expected to increase as the amount of CO emissions decreases, and visa versa. Additionally, when additives such as CO oxidation promoters are added to the regenerator to reduce CO emissions, there is a dramatic increase (e.g., 300%) in NO_x emitted from the FCC regenerator. Unexpectedly, however, compositions in accordance with Applicants' invention reduce NO_x emitted during an FCC regeneration step while simultaneously promoting the oxidation of CO to CO_2, i.e., decreasing the emission of CO.

The Vasalos et al. reference discloses a catalytic cracking catalyst and a method for the use thereof to reduce SO_x and CO emission in an FCC regenerator. The catalyst as disclosed in the Vasalos et al. reference comprises an aluminosilicate containing matrix and a "metallic reactant" which reacts with sulfur oxide. The reference discloses or teaches that the metallic reactant may be a combination of over 30 different metals, including transition metals and an alkaline earth metal.

Vasalos fails to teach or in any way suggest a composition having Applicants' specified components in Applicants' specified ranges. The Examiner

has acknowledged the failure of the Vasalos et al. reference to disclose the exact amount ranges as claimed by applicants. However, the Examiner has suggested that it would have been obvious to one having ordinary skill in the art to select Applicants' combination from the vast number of combinations disclosed in the Vasalos reference to determine Applicants' workable ranges of components. This premise is strongly traversed for several reasons.

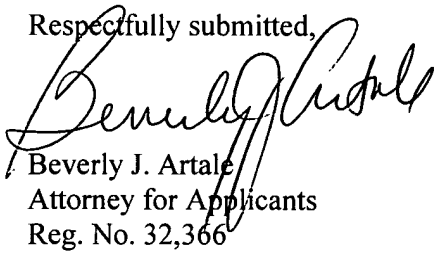
First, Vasalos et al. fails to at all mention a NO_x reduction composition. Consequently, there is no motivation or teaching in the Vasalos reference to modify the materials disclosed therein to provide simultaneously CO oxidation and NO_x control during an FCC process.

Secondly, the Vasalos reference fails to teach or in any way suggest to one skilled in the art, out of the numerous combinations disclosed therein, the criticality of Applicants' specified combination of components and amounts to provide CO oxidation simultaneously with the reduction of NO_x emissions during an FCC process. This position is especially held in light of the attached declaration by George Yaluris, PhD, a skilled artisan in the art of NO_x chemistry and the control of NO_x during an FCC process. The declaration shows the criticality of a composition having Applicants' claimed components and amounts. The declaration further shows that when even one component, i.e. magnesium, is varied outside of the range as claimed by Applicants, the resulting composition is not effective to simultaneously control both NO_x reduction and CO oxidation during an FCC process.

The law is clear that where the prior art has not recognized the result-effective capability of a particular parameter resulting from Applicants' claimed range, i.e., NO_x removal simultaneously with CO oxidation, no expectation would exist that optimizing the parameter would successfully yield the desired result. In *re Anthonie,* 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Consequently, for reasons as stated hereinabove, it is believed that Vasalos et al. fail to render obvious Applicants' invention as now claimed. Consequently, allowance of Claims 1, 3-6 and 10-18 is respectfully requested.

Respectfully submitted,



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